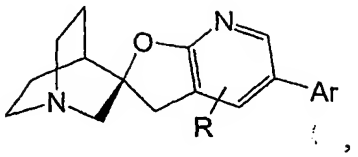
CLAIMS

1. A compound having the formula:



I

and pharmaceutically-acceptable salts thereof, wherein

Ar is selected from a 2-, or 3-linked thiophene, benzo[b]thiophene or benzo[c]thiophene substituted with 0, 1, 2 or 3 substituents independently selected at each occurence from C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} halogenated alkyl, C_{1-4} oxygenated alkyl, C_{2-4}alkenyl, C_{2-4}alkynyl, halogen, $-CO_2R^1$, $-C(O)R^1$, –CN, $–NO_2$, $-(CH_2)_nNR^1R^2$;

n is 0, 1, or 2;

R^1 and R^2 are independently selected at each occurrence from hydrogen or C_{1-4}alkyl;

R is a substituent selected from hydrogen, C_{1-4}alkyl, C_{1-4} halogenated alkyl, C_{1-4} oxygenated alkyl, or halogen.

2. A compound according to Claim 1 or a pharmaceutically-acceptable salt thereof, wherein:

Ar is a 2-, or 3-linked thiophene having 0 or 1 substituents selected from methyl, ethyl, or halogen, and

R is hydrogen.

3. A compound according to Claim 1, selected from:

(2'R)-5'-(thiophen-2-yl)spiro[1-azabicyclo[2.2.2]octane-3,2'(3'H)-furo[2,3-b]pyridine];

(2'R)-5'-(thiophen-3-yl)spiro[1-azabicyclo[2.2.2]octane-3,2'(3'H)-furo[2,3-b]pyridine];

(2'R)-5'-(benzo[b]thiophen-2-yl)spiro[1-azabicyclo[2.2.2]octane-3,2'(3'H)-furo[2,3-b]pyridine];

(2'R)-5'-(benzo[b]thiophen-3-yl)spiro[1-azabicyclo[2.2.2]octane-3,2'(3'H)-furo[2,3-b]pyridine];

(2'R)-5'-(5-methylthiophen-2-yl)spiro[1-azabicyclo[2.2.2]octane-3,2'(3'H)-furo[2,3-b]pyridine];

(2'R)-5'-(4-methylthiophen-2-yl)spiro[1-azabicyclo[2.2.2]octane-3,2'(3'H)-furo[2,3-b]pyridine];
(2'R)-5'-(5-chlorothiophen-2-yl)spiro[1-azabicyclo[2.2.2]octane-3,2'(3'H)-furo[2,3-b]pyridine];
(2'R)-5'-(5-chlorothiophen-3-yl)spiro[1-azabicyclo[2.2.2]octane-3,2'(3'H)-furo[2,3-b]pyridine];
(2'R)-5'-(5-fluorothiophen-2-yl)spiro[1-azabicyclo[2.2.2]octane-3,2'(3'H)-furo[2,3-b]pyridine];
(2'R)-5'-(5-bromothiophen-2-yl)spiro[1-azabicyclo[2.2.2]octane-3,2'(3'H)-furo[2,3-b]pyridine];
(2'R)-5'-(5-fluorothiophen-3-yl)spiro[1-azabicyclo[2.2.2]octane-3,2'(3'H)-furo[2,3-b]pyridine];
(2'R)-5'-(5-bromothiophen-3-yl)spiro[1-azabicyclo[2.2.2]octane-3,2'(3'H)-furo[2,3-b]pyridine];
(2'R)-4-{spiro[1-azabicyclo[2.2.2]octane-3,2'(3'H)-furo[2,3-b]pyridin-5'-yl}thiophene-2-carbonitrile, or
(2'R)-5-{spiro[1-azabicyclo[2.2.2]octane-3,2'(3'H)-furo[2,3-b]pyridin-5'-yl}thiophene-2-carbonitrile.

4. A pharmaceutical composition comprising a compound according to Claim 1, and a pharmaceutically-acceptable diluent or carrier.

5. The pharmaceutical composition according to Claim 4, for use in the treatment of prophylaxis of human diseases or conditions in which activation of the α_7 nicotinic receptor is beneficial.

6. The pharmaceutical composition according to Claim 4, for use in the treatment or prophylaxis of psychotic disorders or intellectual impairment disorders.

7. The pharmaceutical composition according to Claim 4, for use in the treatment or prophylaxis of Alzheimer's disease, learning deficit, cognition deficit, attention deficit, memory loss, Attention Deficit Hyperactivity Disorder, anxiety, schizophrenia, or mania or

manic depression Parkinson's disease, Huntington's disease, Tourette's syndrome, neurodegenerative disorders in which there is loss of cholinergic synapse, jetlag, cessation of smoking, nicotine addiction including that resulting from exposure to products containing nicotine, craving, pain, and for ulcerative colitis.

8. Use of a compound according to Claim 1, in the manufacture of a medicament for the treatment or prophylaxis of human diseases or conditions in which activation of the α_7 nicotinic receptor is beneficial.

9. Use of a compound according to Claim 1, in the manufacture of a medicament for the treatment or prophylaxis of psychotic disorders or intellectual impairment disorders.

10. The use according to Claim 8, wherein the condition or disorder is Alzheimer's disease, learning deficit, cognition deficit, attention deficit, memory loss, Attention Deficit Hyperactivity Disorder.

11. The use according to Claim 9, wherein the disorder is anxiety, schizophrenia, or mania or manic depression.

12. The use as claimed in claim 9, wherein the disorder is Parkinson's disease, Huntington's disease, Tourette's syndrome, or neurodegenerative disorders in which there is loss of cholinergic synapses.

13. Use of a compound according to Claim 1 in the manufacture of a medicament for the treatment or prophylaxis of jetlag, cessation of smoking, nicotine addiction including that resulting from exposure to products containing nicotine, craving, pain, and for ulcerative colitis.

14. A method of treatment or prophylaxis of human diseases or conditions in which activation of the α_7 nicotinic receptor is beneficial which comprises administering a therapeutically effective amount of a compound according to Claim 1.

15. A method of treatment or prophylaxis of psychotic disorders or intellectual impairment disorders, which comprises administering a therapeutically effective amount of a compound according to Claim 1.

16. The method according to Claim 15, wherein said psychotic disorder is Alzheimer's disease, learning deficit, cognition deficit, attention deficit, memory loss, Attention Deficit Hyperactivity Disorder Parkinson's disease, Huntington's disease, Tourette's syndrome, a neurodegenerative disorder in which there is loss of cholinergic synapses anxiety, schizophrenia or mania or manic depression.

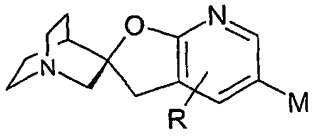
17. A method of treatment or prophylaxis of jetlag, cessation of smoking, nicotine addiction, craving, pain, and for ulcerative colitis, which comprises administering a therapeutically effective amount of a compound according to Claim 1.

18. A compound according to Claim 1, wherein one or more of the atoms is a radioisotope of the element.

19. A compound according to Claim 18, wherein the radioisotope is tritium.

20. The use of a compound according to Claim 19, in a screen for the discovery of novel medicinal compounds which bind to and modulate the activity, *via* agonism, partial agonism, or antagonism, of the α_7 nicotinic acetylcholine receptor.

21. A compound of formula IV:



IV

wherein:

M is $B(OH)_2$, $B(OR^3)_2$ or $SnR^3{}_3$;

R is a substitutent selected from hydrogen, C_{1-4}alkyl, C_{1-4} halogenated alkyl, C_{1-4} oxygenated alkyl, or halogen, and

R^3 is a C_1-C_6 alkyl group.

22. A compound according to Claim 21 which is (2'R)-5'-trimethylstannyl-spiro[1-azabicyclo[2.2.2]octane-3,2'(3'H)-furo[2,3-b]pyridine].